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(54) Bar code symbol readers with edge enhancement.

(57) The depth of modulation of an analog electrical signal generated by a photodetector during scanning of a bar code symbol in the field of bar code scanning is enhanced under circumstances where the modulation of the analog signal has been degraded, for example, by an oversized sampling aperture in relation to the widths of the symbol elements. The analog signal has high frequency components whose low amplitudes are increased in magnitude prior to being conducted to a digitizer. The effect of noise introduced during reading of the bar code is cancelled by comparing in the comparator, the modulation-enhanced analog signal with the second derivative signal derived from the modulation-degraded unenhanced analog signal. The output of the comparator is a digital output signal having a logical level dependent on the amplitude of the enhanced analog signal at each zero crossing of the second derivative signal. The digital output signal is a closer representation of the code read by the scanner.

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EUROPEAN SEARCH REPORT

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EP 90 11 9615

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.5)
A	EP-A-0 276 589 (SYMBOL TECHNOLOGIES, INC.) * Page 11, lines 8-49; figure 10 * - - -	1,2,4,5, 14-17	G 06 K 7/10
A	EP-A-0 299 472 (KRIEG) * Figures 3A,3B,3C,3D; column 7, line 3 - column 8, line 3 * - - -	1,16,17	
A	EP-A-0 240 767 (HEWLETT-PACKARD CO.) * Column 8, line 42 - column 9, line 25; figures 3,5; abstract * - - -	1,16,17	
A	DE-A-3 601 083 (KRIEG) * Figure 3; column 7, line 47 - column 8, line 43 * - - -	1,16,17	
A	US-A-4 877 949 (DANIELSON et al.) * Abstract * - - - - -	1,16,17	
The present search report has been drawn up for all claims			TECHNICAL FIELDS SEARCHED (Int. Cl.5)
			G 06 K
Place of search		Date of completion of search	Examiner
The Hague		12 September 91	GOOSSENS A.M.J.
<p>CATEGORY OF CITED DOCUMENTS</p> <p>X: particularly relevant if taken alone Y: particularly relevant if combined with another document of the same category A: technological background O: non-written disclosure P: intermediate document T: theory or principle underlying the invention</p> <p>E: earlier patent document, but published on, or after the filing date D: document cited in the application L: document cited for other reasons</p> <p>&: member of the same patent family, corresponding document</p>			